

The Canadian Entomologist.

VOL. XXVII. LONDON, NOVEMBER, 1895.

No. 11.

FELTIA SUBGOTHICA, HAWORTH, OR AGROTIS (SUBGEN. AGRONOMA) JACULIFERA, GUENÉE, WHICH?

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The latest statement of this case by the two recognized authorities, Mr. Grote and Prof. J. B. Smith, is as follows:

From "Bull. 44, U.S. Nat. Mus., p. 81 (1893)," by J. B. Smith,
Feltia subgothica, Haw.

jaculifera, var. Gn.

jaculifera, Gn.

tricosa, Lint.

From "List of N. Am. Europteridæ, * * * and Agrotidæ
p. 24 (1895)," by A. R. Grote.

Subgen. *Agronoma*.

Agrotis jaculifera, Gn.

subgothica, Auct. nec Haw.

tricosa, Lint.

jaculifera, Sm. in err.

jaculifera, var. A, Gn.

From 1873, when *jaculifera*, Gn. was first placed in the synonymy of *subgothica*, Haw. by Mr. Grote, until 1890, all American entomologists accepted the reference and did not use Guenée's name. In 1874, Dr. Lintner described Guenée's *jaculifera*, var. A, as a distinct species—*tricosa*, and correctly restricted Mr. Grote's *herilis* (described in 1873) to *jaculifera*, var. B, Gn. Prof. Smith's revision of the synonymy (Bull. 38, U.S. Nat. Mus., p. 111) was made in 1890, principally on the authority of Mr. Butler, who said the year before that "*tricosa*, Lint., is typical *jaculifera*; *herilis* is a poor variety." Mr. Grote bases his recent revision on the authority of Mr. Tutt, who stated (CAN. ENT., XXIII., 159 and 202): "I think there can be no doubt that Haworth's description applies to a well-known variety of *Agrotis tritici*."

An historical investigation which I made, a few years ago, of the names of the species of *Drasteria*, suggested that perhaps a similar critical study of the early literature of the insect under discussion might throw some light on the subject and enable one to arrive at an approximately correct synonymy. What little experience I have had in this line of work leads me to believe that there must be much similar critical study before the nomenclature of the moths reaches anywhere near the stability that Mr. Scudder's historical investigations have given to the nomenclature of the butterflies.

In 1810, Haworth described (Lep. Britt., p. 224) *subgothica* from a supposed English specimen; the sale catalogue of Haworth's collection published in 1834 indicates that he had but one specimen. As Haworth's work is very rare (I have not been able to get track of a single copy in this country), and as neither Mr. Grote (CAN. ENT., XXIII., 202) nor Prof. Smith (Bull. U. S. Nat. Mus., No. 44, p. 81) have ever seen the original description of *subgothica*, the following copy of it (obtained through the kindness of Mr. Champion, Librarian of Ent. Soc. of London) will be of interest and value:

"185. *subgothica*. (The Gothic Dart) alis griseo-fuscis, costa late at dimidiatim, stigmatibusque pallidis.

Habitat in Anglia valde infrequens. In Musæis tribus solum vide.

Expansio alarum. (Mr. Champion gives no figures.)

Descriptio. Præcedentibus (*sagittifera*) affinis absque punctis posticis sagittatis. Stigma anticum, subtriangulare, posticum reniforme: ante et inter hæc arcus niger qui reversus apparit in alis expansis. Stigma teliforme prægrande a basi fere ad medium, sed lineolis duabis divaricatum transversis interruptum. Posticæ pallidæ fimbria fusca."

No figure of the insect is given, and it is not definitely known if the single type specimen exists, thus much depends upon this description. Is there anything in it that does not apply to our American insect? Does it fit any known variety of the European *tritici* better?

Except in Stephens's Catalogue, *subgothica* seems not to again appear in the literature until 1829, when Stephens describes and figures (Ill. Brit. Ent., Haust., II., p. 126, pl. 22, fig. 3) an insect as *subgothica*, which he

says he obtained from a Mr. Raddon, who had evidently labelled it "near Barnstaple, Devon." A photographic copy of Stephens's figure is reproduced at 1a on the plate. This figure is accepted by Mr. Grote (CAN. ENT., XXIII., 202) as that of *jaculifera*, Gn., but Prof. Smith doubts it (Bull. 44, U.S. Nat. Mus., p. 81). However, I think that a glance at the next figure of the insect that appeared, taken doubtless from Stephens's specimen, will remove all doubt as to what insect Stephens tried to represent. This figure, which is reproduced at 1b on the plate [it is enlarged to natural size], is from Wood's Index Entomologicus, pl. 9, fig. 149 (1839). All must admit that it is one of the best figures of our American insect ever published. Although Wood does not state definitely that his figure was made from Stephens's specimen, we know he did thus make use of Stephens's collection for many of his figures, as he states in his preface. But one more figure of the insect seems to have appeared in English works. This one, by Humphrey (in Humphrey and Westwood's British Moths and their Trans., I., pl. xxiv., fig. 1, 1843), was recently referred to by Mr. Barrett (Ent. Month. Mag., XXV., 224) as being certainly a variety of *A. tritici*. The fact is, as Humphrey states, that his figure was copied from Stephens's figure; this was evidently not known to Mr. Barrett, as the context of his article indicates. Humphrey's figure is reproduced at 1c on the plate.

Up to 1847, the English entomologists considered *subgothica* a British insect and a distinct species. Then, Mr. Doubleday stated (The Zoologist, V., 1728) that "Haworth's insect is evidently simply a variety of either *Agrotis tritici* or *aquilina*. The species described and figured by Stephens is American." For many years after this the name *subgothica* rarely appeared in British lists and only as a variety of *tritici*; it apparently does not occur at all in recent lists. It has never been taken in England, so far as I can find any record, since Stephens's time.

The name *subgothica*, Haw., was introduced into American literature by Dr. Fitch in 1856 (Second Rept. on Insects of N. Y., p. 546). It has been in universal use here since, and no American writer has seriously questioned the identity of our species with the *subgothica* of Stephens and later English writers, or even with the *subgothica* of Haworth, until 1891, when Mr. Grote changed his mind in accordance with the opinion of Mr. Tutt. I think that all now agree that the species under discussion is distinctly American. It undoubtedly has never occurred in England, notwithstanding the records of its English habitat by the earlier English

writers. Dr. Fitch suggested that the eggs or larvæ may have been accidentally carried to England, but Doubleday's explanation is doubtless the more correct one. He says (The Zoologist, V., 1729): "I have traced all the specimens which I have seen of this species (the one described by Stephens) in collections of British Lepidoptera to one source, and I believe the gentleman who distributed them [Mr. Raddon is the gentleman referred to] inadvertently mixed a number of North American insects with his British ones. I received from him as *British* a Bombyx which my brother took in Florida; and Mr. Benjamin Standish possesses two Bombyces, one of them a *Cerura*, the other perhaps a *Notodonta*, from the same entomologist, which were sent to him as British, whereas both are well-known North American insects." There can be no doubt that several American insects found their way into the larger English collections formed in the beginning of the present century; and some of these, as Doubleday points out, were described by Haworth and Stephens as English insects. The evidence on this point is very conclusive as regards *Drasteria crassiuscula*, Haw.

Wood's figure (*ib* on the plate) and Doubleday's testimony are sufficient evidence, I think, that the *subgothica* of Stephens and later writers is our common American insect. But, is Haworth's *subgothica* the same as Stephens's? Probably Haworth's single type specimen could not now be found, if it exists at all. Without the specimen, we must depend on the original description and a little circumstantial evidence to settle this point. Haworth's specimen may easily be the one which Mr. Barrett recently found in an old English collection made up of specimens obtained from older collections by a Mr. Burney, who was contemporary with—and corresponded with—Haworth and others, and many of whose insects ultimately fell into his hands (Ent. Month. Mag., XXV., 223). Mr. Barrett says there was one specimen that proved to be really a type of *A. subgothica*, and the specimen was not a variety of *tritici*. Mr. Dale says (p. 246 of the same magazine) that this specimen "probably came from Mr. Raddon, the gentleman referred to by Mr. Doubleday" as having introduced several American insects into English collections; Stephens's figure was made from one of these specimens. Haworth's description seems to apply very well to our American insect, and it also affords a valuable bit of circumstantial evidence in the remark that he had seen the species in only three museums. It is hardly probable that one of these three col-

lections was not that of Stephens, then one of the few great English collections. Thus, I believe that the weight of evidence indicates that the *subgothica* of Haworth and Stephens were the same species.

But, curiously enough, while all American entomologists have claimed the name *subgothica*, Haw., for our insect, the English authors since Doubleday have claimed Haworth's insect as a variety of their *tritici*. Doubleday said it was "simply a variety of either *tritici* or *aquilina*," but it was soon restricted to the former in British lists, and it is still considered as such by Mr. Tutt. The evidence in support of this seems to be confined principally to the simple statement of Doubleday, although Tutt intimates that he has seen Haworth's description; but Tutt does not (CAN. ENT., XXIII., 159) know our American insect. I think the evidence produced to show that Haworth's *subgothica* is our American insect outweighs any opinion which English writers, who do not know our insect, may form from the original description alone.

The name *jaculifera*, which occupies so conspicuous a part in the synonymy of this insect, was proposed by Guenée, in 1852, for an American insect. His description of the species includes a good characterization of the type, followed by brief descriptions of two varieties, A and B. I think both Mr. Grote and Prof. Smith agree that Guenée's figure (reproduced at *1 d* on the plate) and his description of the type of the species correspond to what American writers have been calling *subgothica*, Haw., for the past quarter of a century. *Jaculifera*, Gn., was first placed in the synonymy of *subgothica*, Haw., in 1873, by Mr. Grote, and on the same page he described both of Guenée's varieties, A and B, as a new species—*herilis*. In 1874, Dr. Lintner made a careful study of the forms included under Guenée's specific title *jaculifera*, with the result that Mr. Grote's *herilis* was restricted to *jaculifera*, var. B, Gn., and var. A was described as a new species—*tricosa*.

No one has since questioned the specific rank of Guenée's varieties. Therefore, according to Canon XXVIII. of the A. O. U. Code of Nomenclature, the name *jaculifera* must be restricted to the first or main part of Guenée's description; this is the only portion of the description that can apply to his figure or to the insect under discussion. It is true, as Prof. Smith says (Bull. 38, U. S. Nat. Mus., p. 113): "Under all circumstances Guenée's name must stand for one of the forms, since he had all three before him," but in 1873 and 1874 the name was restricted to, or "was retained for that portion of the group to which it was first applied"

(to use the language of the Canon referred to) by Mr. Grote and Dr. Lintner. Therefore, I cannot understand how Guenée's name can be consistently applied to Dr. Lintner's *tricosa*, and it is not in accordance with the rule of nomenclature just cited. The fact that the form which agrees with the main part of Guenée's description and with his figure may or may not be a synonym of *subgothica*, Haw., does not affect the case in any way. I believe Mr. Grote is right in his protest (CAN. ENT., XXIII., 151) against the resuscitation of *jaculifera* at the expense of *tricosa*.

As has been stated, Prof. Smith's synonymy is founded principally on the statement of Mr. Butler that "*tricosa*, Lint., is typical *jaculifera*; *herilis* is a poor variety." The antennal differences between *herilis* and *tricosa*, pointed out by Prof. Smith, show that Mr. Butler did not study the species very carefully. The other point has been discussed by Mr. Grote as follows: "Guenée happens to figure typical *jaculifera* and he figures typical *subgothica*! Prof. Smith does not quote Guenée's illustration, which contradicts both Butler's statement and his own course. Guenée's types of '*jaculifera*,' or so-called 'types,' were several in number at least, as he included two other species as varieties. One of these so-called types Mr. Butler may have, and this may be a *tricosa*. Guenée's var. A. Guenée made three mistakes as to his material: First he described and figured *subgothica* as *jaculifera*; then he described specimens belonging to two different species, *tricosa* and *herilis*, as varieties of *jaculifera*. Under no circumstances can Butler's statement be correct (CAN. ENT. XXIII., 151)." The enlarged figures (twice natural size) of a front and hind wing of each of the three species just discussed show some of their differences and will aid in their determination. I believe the above evidence warrants the following synonymy for these much-discussed forms:

subgothica, Haw.

jaculifera, Gn. (type and figure).

tricosa, Lint.

jaculifera, var. A, Gn.

herilis, Grote.

jaculifera, var. B, Gn.,

or the same as that given by Dr. Lintner in detail in 1874 (Ent. Cont., III., 161), and accepted by Mr. Grote until recently.

Shall it be *Agrotis*, *Feltia*, or *Agronoma subgothica*, Haw.? Apparently Mr. Grote and some other systematists are not yet ready to

accept all of the new genera which Prof. Smith has recently proposed in his revision of the old genus *Agrotis*. While I am a thorough believer in the value of sexual characters in the classification of the Noctuids, I should hesitate to establish genera upon them without first examining other than our own fauna. In a recent study of the genus *Drasteria* I found that all of the known species in our fauna had decidedly asymmetrical male genitalia, while the species in the allied genera *Euclidia* and *Caenurgia* had not; nor had this peculiarity been noticed in any other Noctuids. Although none but American forms have been placed in *Drasteria*, I am sure that at least one of the common European Euclidias belongs to it, but I am not yet sure that this European species does not have symmetrical male genitalia.

While it is true that Walker insufficiently characterized his genus *Feltia*, yet the description of a species—*ducens*—made it a valid generic title; and as *ducens* is a synonym of *subgothica*, Prof. Smith had a right to recognize *Feltia*. But Mr. Grote now claims (in his List for 1895) that *Feltia* must fall as a synonym of Hübner's genus *Agronoma*. Hübner placed four European species in the genus, and Mr. Grote thinks the type species is *valligera* (*vestigialis*). Now, if it can be shown that *subgothica* is congeneric with the European *valligera*, and both Stephens and Guenée mention a resemblance, then Mr. Grote is right in placing *Feltia* in the synonymy. Mr. Grote gives *Agronoma* only subgeneric rank. I prefer to leave the discussion of this point to Messrs. Grote and Smith; it will require a more critical study and comparison of the American and European species than has yet been made before the question can be settled.

In the light of our present knowledge, I prefer to continue to use the name *Agrotis subgothica*, Haw., which has become so familiar to American entomologists from its frequent use in both our systematic and economic publications.

Agrotis muranula.

In his last revision of the Agrotids (Bull. 44, U. S. Nat. Mus., p. 85) Prof. Smith placed *muranula*, G. & R., in the synonymy of *vetusta*, Walk. This called forth the following protest from Mr. Grote under the above heading (CAN. ENT., XXVI., 81): "Two species, properly referred by me at the time to *Agrotis*, were described by Walker under the same specific name *vetusta*. One of these turns out to be, as I had suggested in my essay, *muranula*, G. & R., and this latter name, I claim,

under the custom and as accepted in Staudinger's catalogue, should be retained for the species it designates, since at the time it was free to be named and no subsequent generic separation can overturn its real and conceded right at the time it was proposed. *Vetusta*, Walk., as applied to *murænula*, must be relegated to the synonymy."

The facts are that Walker described *Mythimna vetusta* in 1856 and *Agrotis vetusta* in 1865; and Grote and Robinson described *Agrotis murænula* in 1868. In 1882, Mr. Grote stated that perhaps *Mythimna vetusta*, Wlk. (not both this species and *Agrotis vetusta*, as Prof. Smith states in Bull. 38, U. S. Nat. Mus., pp. 125 and 212), was *murænula*, and that it certainly was an *Agrotis*. Walker had thus unwittingly given two species of *Agrotis* the same specific name, and hence one was free to be renamed. But which one—the one described in 1856 as *Mythimna vetusta* or the *Agrotis vetusta* described in 1865? Mr. Grote evidently assumes that the former name must fall, but usage and consistency dictate that the older name should be retained. An examination of type specimens by Prof. Smith shows that *Mythimna vetusta*, Wlk., and *Agrotis murænula*, G. & R., are the same species. Then *murænula* must be placed in the synonymy of the older *vetusta*; and Walker's *Agrotis vetusta*, if it proves to be a valid species, is free to be renamed, and must be renamed should it be congeneric with *Porosagrotis vetusta*, Wlk. Thus, I believe the facts warrant Prof. Smith's use of the name *vetusta*, Wlk., for *murænula*, G. & R. Mr. Grote seems to have omitted *Porosagrotis obesula*, Smith, from his List for 1895.

THE SECOND ANACRABRO, AND THE SMALLEST AMERICAN OXYBELUS.

BY T. D. A. COCKERELL, N. M. AGR. EXP. STA.

Anacrabro boerhaviae, n. sp. or var.—♂ about 7 mm. long; differs from *ocellatus* by the yellow markings, which are as follows:—Dorsum of prothorax and tubercles yellow, the tubercles with a black central dot. Mesothorax all black, except a small yellow spot on each side at hind border, adjacent to yellow spot of scutellum. Scutellum with a pair of large yellow spots. Postscutellum yellow. Inner side of anterior half of anterior femora yellow. Tibiæ yellow, with more or less black behind. Tarsi yellow, slightly tending to orange. Segments 1-6 of abdomen presenting a yellow spot medially, and a large yellow patch on each side. The median spot on first segment is round, that on 2-3

transversely oval, that on 4 transversely spindle shaped, that on 5 broad with truncate ends, that on 6 nearly square, but slightly constricted on each side. Lateral patches more or less bifid at their inner ends, and produced to a point below on lateral margin of abdomen. Strongly punctured, much more sparsely on pleura. Pubescence of face and cheeks silvery. Eyes very large, at least as near together on middle of face as the two upper ocelli are to one another.

Hab., Las Cruces, N. M., Aug. 23, 1895, on *Boerhavia*, believed to be *B. erecta*. The type is now in Coll. Am. Ent. Soc. Since this does not seem to differ structurally from *A. ocellatus*, Pack., the only species hitherto described, Mr. Fox suggests that it may be but a variety of it. The nearest known locality for true *ocellatus* is West Point, Nebraska.

The *Boerhavia* has sticky flower-stalks, which catch insects—for what purpose I do not know. *Harrisina coracina* is often seen dead on the stalks, caught by the sticky exudation.

Oxybelus cladothricis, n. sp.—♀ about 3 mm. long; rather shiny, especially the abdomen; with a strong lens the head and thorax appear to be minutely punctured; with a compound microscope the surface is seen to be minutely reticulated, and regularly and not densely punctured. Head large. Second joint of flagellum decidedly shorter than first, third a little shorter than second. Wings hyaline, nervures dark brown, marginal cell pointed at tip. Colour black, with the abdomen entirely red. Median hind border of prothorax broadly, tubercles, squama, tibiae except one side of posterior ones, and a large portion of anterior femora, white. Tarsi brownish or rufescent. Tegulae pale testaceous. Sides of face, cheeks, and pleura with glittering white pubescence. Spine minute, straight, obscurely notched at tip. Squama with the two sides united, the points terminal and curved inwards, the median notch rounded.

♂ a little smaller, abdomen narrower, and ornamented with glittering silvery pubescence, forming narrow bands at distal margins of segments. No lateral spines on abdomen. Squama broader, squarely notched in middle, the points more curved.

Hab., Las Cruces, N. M., early in Sept., 1895, on *Cladanthrax cryptantha*, the plant determined by Prof. Wooton.

This *Oxybelus* will be easily known by its small size, and red abdomen. The pointed marginal cell is also peculiar, as *4-notatus*, *cornutus*, *emarginatus*, *sparideus*, *aztecus*, and probably most of the genus have it narrowly truncate. It is pointed in *argenteopilosus*, judging from Cameron's figure, though nothing is said about the matter in the description.

BUTTERFLIES OF SOUTHERN MANITOBA.

BY E. F. HEATH, THE HERMITAGE, CARTWRIGHT, MAN.

The following is a list of Diurni taken in Southern Manitoba about Section 35, Township 2, Range 15, W. of the first principal meridian, near the Village of Cartwright, and collected at intervals during the last ten or twelve years :—

Papilio oregonia, Edw.—Only once seen, and taken three years ago—a rather worn specimen. Taken in July.

Papilio asterias, Fab.—General, but not very abundant.

Papilio turnus, Linn.—General, but not very abundant, except in '93, when it was rather numerous.

Papilio turnus, Linn.—Very dark ♀—very heavily banded; appeared later than the ordinary form.

Pieris protodice, Bd.—Lec.—Common and abundant.

Pieris rapæ, Linn.—Occasionally.

Pieris napi oleracea, Esper.—Occasionally.

Nathalis iole, Bd.—One specimen only seen. Taken flying over some flowering annuals in garden, about end of July.

Colias eurytheme, var. *Eurytheme*.

<i>Colias eurytheme</i> , var. <i>Keewaydin</i> , with the albino form.	} All very abundant. Ariadne seems to be absent.
<i>Colias eurytheme</i> , var. <i>Eriphyle</i> .	

Danais archippus, Fab.—Abundant throughout the summer.

Argynnis cybele, Fab.—Abundant. Occurs during July.

Argynnis cypria, Edw.—Occasionally in August.

Argynnis aphrodite, Fab.—Very rare, one only taken.

Argynnis lais, Edw.—Abundant. Occasionally in August.

Argynnis myrina, Cram.—Abundant. Occurs in the early spring.

Argynnis bellona, Fab.—Abundant. Occurs in the early spring.

Euptoieta claudia, Cram.—Occasionally and generally, during July and August.

Phyciodes nycteis, Doubl.—Hew.—Common. Of this I have taken one curious variety, in which the orange is replaced by white; the specimen not being at all worn.

Phyciodes carlota, Reak.—Common

Phyciodes tharos, Dru.—Common.

Grapta interrogationis, Fab., var. *Fabricii*.—Occasionally. On wild hop, in August.

- Grapta interrogationis*, var. *umbrosa*.—Occasionally.
Grapta comma, Harr., var. *dryas*.—Rarely.
Grapta progne, Cram.—Not common.
Vanessa antiopa, Linn.—Abundant in the latter end of summer.
Vanessa californica, Bd.—Two specimens taken. Not seen for some years.
Vanessa milberti, Godt.—Abundant.
Pyrameis atalanta, Linn.—Sometimes abundant.
Pyrameis huntera, Fab.—Some years ago, I think in 1884, this insect was abundant, so much so that I only caught one or two specimens, thinking it would be equally general in other years. Since then I have only seen and taken one insect. Occurred in August.
Pyrameis cardui, Linn.—Common in some years, scarce in others.
Limenitis arthemis, Dru.—Common in June and July.
Limenitis disippus, Godt.—Occasionally in June and July.
Neonympha canthus, Bd.—Lec.—Locally and occasionally occurs latter end of June and July.
Cœnonympha inornata, Edw.—Common.
Satyrus nephele, Kirby.—Very common.
Satyrus nephele, v. *Boöpis*.—Very common.
Chionobas varuna, Edw.—One only seen and taken, and that a rather worn specimen, during August.
Thecla calanus, Hub.—Rare.
Thecla strigosa, Harr.—Abundant; occurs in July.
Thecla augustus, Kirby.—Only one seen and taken during May.
Thecla titus, Fab.—Common during July.
Thecla.—Not identified; appears to be a new species. Only one seen and taken some years ago.
Chrysophanus helloides, Bd.—Lec.—Abundant in June and July.
Lycæna sæpiolus, Bd.—Only two specimens taken at the end of June.
Lycæna Couperii, Grote.—Common in May.
Lycæna pseudargiolus, v. *neglecta*, Edw.—Common in June.
Lycæna pseudargiolus, v. *lucia*, Edw.—Rare.
Lycæna melissa, Edw.—Common in July.
Lycæna comyntas, Godt.—Rarely seen.
Lycæna amyntula, Bd.—Common during June and July.
Lycæna aquilo, Bd.—Only one seen and taken June 12th, 1894.
Carterocephalus mandan, Edw.—Local and not abundant, in July.

Thymelicus garita, Reak.—Occasionally.

Pamphila zabulon, Bd.—Lec.—Common in June.

Pamphila zabulon, v. *hobomok*.—Common in June.

Pamphila nevada, Scud.—One specimen taken. Occurs in August and September, when I have little opportunity for collecting.

Pamphila peckius, Kirby.—Common in June and July.

Pamphila mystic, Scud.—Occasionally in June and July.

Pamphila cernes, Bd.—Lec.—Occasionally in June and July.

Pamphila metacomet, Harr.—Occasionally in June and July.

Amblyscirtes vialis, Edw.—Occasionally in May.

Pyrgus tessellata, Scud.—Occasionally in July and August.

Nisoniades brizo, Bd.—Lec.—Fairly abundant in May.

Nisoniades icelus, Lint.—Fairly abundant in May.

Nisoniades juvenalis, Harr.—Occasionally in May.

Eudamys pylades, Sm.—Abb.—Occasionally in May and June.

The following are rough notes on the occurrence and capture of *Diurni*, etc., during 1894, about my farm in Manitoba:—

April 22nd—I first noticed hibernated specimens of *V. antiopa* and *V. milberti* flying about in the sunshine.

“ 26th—In the evening I took several *Noctuæ*, some apparently belonging to the genus *Tæniocampa*, and also a dark gray moth, flying about the breaking catkins of the white poplar. Also on several evenings subsequently.

May 18th—*Lycæna Couperii* tolerably abundant, and *L. pseudargiolus-neglecta* just appearing.

“ 23rd—*L. Couperii*, *Nisoniades juvenalis*, *brizo* and *icelus* abundant on the flowers of the Bear-berry (*Arctostaphylos uva-ursi*). At the same time I took the only specimen of *Thecla augustus* I have yet seen. *Lycæna amyntula* beginning to make its appearance.

“ 27th—First noticed *A. myrina*.

“ 28th—*Phyciodes carlota* and *Colias eurytheme* made their appearance.

“ 30th—*Papilio turnus*, several, but not nearly so numerous as in 1893.

“ 31st—I found on a small patch of prairie (on which a certain grass, the name of which I do not know, seemed abundant) several specimens of *Amblyscirtes vialis*, which I had not seen for several years. *Danais archippus* seen for the first time.

- June 1st—*V. atalanta* and *Eudamus pylades* occurred.
- " 7th—*Phyciodes tharos* and *Pamphila zabulon* taken.
- " 9th—*Carterocephalus mandan* taken, and *Cænonympha inornata* generally during this month and July.
- " 10th—*Limenitis arthemis* first appeared.
- " 12th—A single specimen of *Lycæna aquilo* taken flying on the banks of the river with "*Amyntula*," etc.
Phyciodes nycteis abundant, and also "*Pratensis*."
- " 13th—*Argynnis lais* and *Lycæna melissa* taken in July.
- " 15th—*Chrysophanus epixanthe* flying over patches of knot-grass (*Polygonum aviculare*) and *Lycæna sæpiolus*.
- " 21st—I saw a butterfly which I watched for some time, but was unfortunately unable to capture, which I have very little doubt was *Pyrgus centaureæ*. I have never before seen anything like it.
- July 3rd—*Thecla titus* abundant, and one or two *Limenitis disippus*.
- " 6th—*Thecla strigosa*, *Pamphila metacomet* and *A. cybele* noticed.
- " 7th—*Satyrus nephele*, *Euptoieta claudia* and *Neonympha canthus*. Early for *E. claudia*.
- " 14th—*Papilio asterias* and *Vanessa antiopa*. After this date I was too much engaged in farm work to do much collecting, but I noticed far fewer insects than usual, attributable to the extremely hot, dry weather we had during the latter half of July and August. *P. protodice* much less abundant than usual, and also the later forms of *C. eurytheme*. A very few *V. atalanta* were seen, and I do not think I saw a single *V. cardui*, and certainly none of *V. huntera*. The genus *Grapta* was conspicuous by its absence, and *V. milberti* much less numerous than usual. Several times during August, while on either the mowing machine or the binder, I noticed a *Pamphila* rise suddenly in couples, some six or eight feet into the air from the grass, and fight for a few seconds, and then drop as rapidly, like stones, back into the grass. Needless to say I was unable to identify them, but I have taken "*mystic*" about that time, and also "*nevada*." I did not notice a single specimen of *P. tessellata* in 1894.

In addition to the above list, I watched for some time last summer, but unfortunately was unable to take, what I am almost certain was a specimen of *P. centaureæ*. One thing I have particularly noticed about collecting in Manitoba is the occurrence of single specimens of a genus from time to time; the most careful search in the locality of the capture failing to produce any more. The same, to a great extent, occurs with *Noctuæ*.

I must not omit to here publicly express my thanks to Mr. James Fletcher, of Ottawa, for the very kind assistance he has given me in identifying many of my species, and I am sure from the trouble I have given him, he will be more thankful than myself that the task is now ended.

NOTES ON MR. E. F. HEATH'S COLLECTION OF BUTTERFLIES.

BY JAMES FLETCHER, OTTAWA.

In August last, when visiting Mr. E. Firmstone Heath, of The Hermitage, near Cartwright, Man., I had an opportunity of examining his fine local collection of Lepidoptera, which consists of twelve cases of well-set and preserved butterflies and moths. Among the butterflies were some species, the occurrence of which in Southern Manitoba surprised me very much.

Mr. Heath's residence is situated in a beautiful wooded valley, and on the bank of a small winding river, the Indian name of which means the "Long River which runs crookedly." The trees on the banks of the valley, which is about a mile wide at The Hermitage, are chiefly scrub oaks (*Quercus macrocarpa*), ash-leaved maples, aspen and balsam poplar (white and black poplar of the settlers), Saskatoon (*Amelanchier alnifolia*), white thorn (*Crataegus coccinea*), wild plum, a few American elms, choke-cherry, and various willows. The locality is undoubtedly a rich one, presenting a great variety of natural habitat for insects. The general character of the country surrounding the valley is a rolling grassy prairie, here and there broken by farms, and bluffs of white poplar.

This picturesque spot is about ten miles north of the boundary of the State of North Dakota, and about twenty-five miles north-east of the Turtle Mountains.

The following species in Mr. Heath's collection struck me as being of particular interest :—

1. *Papilio oregonia*.—Precisely like specimens taken in the Okanagan Valley, British Columbia, which was the most eastern locality previously recorded in Canada, nearly one thousand miles due west. It may be noted that *Artemisia dracunculoides*, the food plant of *P. oregonia* in British Columbia, also grows wild on Mr. Heath's farm.

2. *Vanessa californica*.—The occurrence of this species in Manitoba is no less remarkable than that of the last. I do not think there is any previous Canadian record east of the Rocky Mountains.

3. *Nathalis iole*.—This is very far out of its previously known range.

4. *Chionobas varuna*.—Chiefly notable for the late date of capture, namely, August ; but the locality also is much farther east than previous records.

5. *Thecla strigosa*.—Of this species I have had scores sent to me for identification, from Ontario and Eastern Canada, during the last five or six years, and never saw but two specimens of the form showing the large fulvous patches on the primaries, which Mr. Scudder thinks was intended to be represented under the name "*T. liparops*" by Boisduval and Leconte. As far as I can remember, all of the Manitoban specimens of *T. strigosa* that I have seen (about 40 in number) show these fulvous blotches very distinctly, and the specimens are slightly but uniformly smaller than specimens from Ontario, etc. This would indicate, I think, that the Manitoban form is sufficiently distinct to be designated by a special name, and I suggest for it *T. strigosa*, var. *liparops*. I have specimens from Cartwright, Winnipeg and Brandon.

6. *Thecla* —? Mr. Heath has one specimen of a very fine *Thecla*, quite unlike any described American species, of which I hope he will some day obtain further specimens for description.

7. *Lycæna amyntula*.—This is the common tailed-blue, not only in Southern Manitoba, but at Winnipeg, and as far east, at any rate, as Nepigon, north of Lake Superior. The eggs are laid on the pedicels of the flowers of *Lathyrus ochroleucus*, in identically the same manner as is done by the same species in British Columbia, on the pedicels of the same species and of *Lathyrus venosus*.

SUPPLEMENTARY NOTE TO THE SATURNIANS.

BY A. RADCLIFFE GROTE, A. M., HILDESHEIM, GERMANY.

Since writing my paper (CAN. ENT., 263, ante*) I have been able to examine a specimen of the Asiatic *A. selene*. The moth differs from *luna*, chiefly in the pointed apices of fore wings, the outer margin sweeping inwardly in an even curve. I cannot consider this character of generic value, since precisely the same separates the South American *Eacles magnifica* from our *E. imperialis*. In the same species of certain Papilionides, a similar variation has been noted. The exterior bands appear faintly also in certain examples of *luna*, while the whiter colour is shown by the variety *Rossi*. Whether this tendency to white is reactionary in its nature, may be questioned. The tails are more developed in the Asiatic species, but (without denuding) I cannot find any neuronal differences. I conclude, then, that Leach's term *Actias* is also applicable to *A. luna*. On the other hand, the European *isabelle* seems to admit of a distinct genus. This species is confined to a limited region of the Peninsula, and its geographical isolation has apparently preserved among its characters some which may have belonged to a more primitive type of tailed Saturnians. The American and the Asiatic species would be then nearer related, pointing to a different epoch of separation for the European form. The resemblance between the larvæ of *polyphemus* and *luna* seems to warrant the association of the genera, and justify my disposition of the groups. I take it that the members of the Attacid group: *Attacus*, *Philosamia*, *Callosamia*, are more highly specialized forms as compared with the Saturniid group: *Samia*, *Saturnia*, *Agapema*. These two groups would be nearer related in phylogenesis to each other than to the Teleid group, which stands at some little distance. Mr. Dyar writes me that in *Telea*, at the last stage, the larva shows a sparse coating of secondary hair, short and fine, most abundant at base of legs. In *luna*, on the contrary, the secondary hairs are most abundant dorsally, having enlarged ends, and are nearly entirely absent subventrally, except on the foot itself. From this fact, and that of the still greater reduction of the tubercles in *luna*, I am inclined to believe *Actias* the more specialized form, as compared with *Telea*; this view seems to be sustained by the moth stage and would bear out the position assigned to the genera in a linear series. It seems, then, probable that *Actias* and *Telea* represent a lateral branch of the family stem and that they have pursued to some extent a parallel development. This is shown by the greater uniformity in colour, the absence of contrasting ornamentation in the larvæ. In all stages these moths rely on protective resemblances, needed by insects so large and apparently so very helpless.

*On page 263, ante, foot-note, for "Xyloicus" read "Hyloicus."

COLEOPTERA TAKEN AT LAKE WORTH, FLORIDA—No. II.

BY JOHN HAMILTON, M. D., ALLEGHENY, PA.

The latitude stated in the former paper† should have been 26° 40'. This winter my location was six miles south from Pitt's Island, where the collecting was done last season. From February 1st to May 6th is the time included. During February and March few beetles occurred, as the temperature ranged from 52° to 74° and on one occasion fell to 27°. From the 10th to the 24th of April no collecting was done, and all but a few of the species enumerated were taken between the latter date and May 4th. The species not known to the writer to occur north of Florida are marked with a *; those extending westward around the Gulf, with a †; the others have a wide northern and western distribution. *Philonthus micans* is to be erased from the previous list, as that species does not occur in Florida, the black form of *alumnus* having been erroneously so determined.

†*Pasimachus subsulcatus*, Say.*Dyschirius sphaericollis*, Say.†*Clivina picea*, Putz.*Ardistomis viridis*, Say.*Lebia abdominalis*, Chd.†*Callida decora*, Fab.**Plochionus dorsalis*, Horn.**Apenes angustata*, Schwarz.†*Brachynus 4-pennis*, Dej.*Anatrichis minuta*, Dej.*Harpalus nitidulus*, Chd.†*Philhydrus consors*, Lec.*Cercyon prae-textatus*, Say.*Silpha inaequalis*, Fab.†*Colpodota pulchra*, Kraatz.*Staphylinus tomentosus*, Grav.*Actobius*, n. s.*Lathrobium*, n. s.**Paederus oblitteratus*, Lec.†*Erchomus laevis*, Lec.*Oxytelus insignitus*, Grav.*Olibrus vittatus*, Lec.**Stilbus floridanus*, Casey.*S. pusillus*, Lec.*Megilla maculata*, DeG.†*Psyllobora nana*, Muß.*Scymnus collaris*, 2 var., Mels.**Languria marginipennis*, Schwartz.*Lasconotus pusillus*, Lec.*Catogenus rufus*, Fab.*Laemophloeus*, sp.*Cryptomorpha desjardinsi*, Guer.*Loberus impressus*, Lec.*Dermestes vulpinus*, Fab.*Hololepta 4-dentata*, Fab.*Saprinus*, sp.†*Carpophilus tempestivus*, Er.*Trogosita virescens*, Fab.*Tenebrioides*, sp.*Cypon variabilis*, var. *modestus*,

Lec.

Alaus myops, Fab.

- **Anchaustus asper*, *Lec.*
†*Monocrepidius suturalis*, *Lec.*
†*Ludius hepaticus*, *Germ.*
Glyphonyx recticollis, *Say.*
Melanotus communis, *Gyll.*
M. clandestinus, *Er.*
Chrysobothris chrysoela, *Ill.*
Photinus lineellus, *Lec.*
†*Photuris frontalis*, *Lec.*
Polemius, sp.
Aphodius ruricola, *Mels.*
A. stercorosus, *Mels.*
Cleotus globosus, *Say.*
Anomala undulata, *Mels.*
Euphoria melancholica, *Gory.*
Trichius delta, *Forst.*
**Leptostylus*, n. s.
Hippopsis lemniscata, *Fab.*
**Spalacopsis filum*, *Dur.*
**Lema conjuncta*, *Lac.*
Anomæa laticlavata, *Forst.*
†*Metachroma pellucidum*, *Cr.*
†*Dysonycha collata*, *Fab.*
Epitrix brevis, *Schwartz.*
E. parvula, *Fab.*
Coptocycla bicolor, *Fab.*
C. clavata, *Fab.*
†*Caryoborus arthriticus*, *Fab.*
Bruchus scutellaris, *Fab.*
B. obscurus, *Say.*
Alobates barbatus, *Knoch.*
**Blapstinus fortis*, *Lec.*
*B. *estriatus*, *Lec.*
†*Tharsus seditiosus*, *Lec.*
Uloma punctulata, *Lec.*
Arrhenoplita viridipennis, *Fab.*
Platydema ruficorne, *Sturm.*
P. erythrocerum, *Lapl.*
†*P. subquadratum*, *Mots.*
P. subcostatum, *Lapl.*
**Hypophloeus*, n. s.
†*Talanus langurinus*, *Lec.*
**Cteniopus Murrayi*, *Lec.*
Oxaxis, n. s.
O., n. s. (blue).
**Mordellistenæ floridana*, *Smith.*
**M. splendens*, *Smith.*
Tomoderus interruptus, *Laf.*
Anthicus fulvipes, *Laf.*
Tyloderma variegatum, *Horn.*
T. æreum, *Say.*
Conotrachelus seniculus, *Lec.*
†*Cryptorhynchus minutissimus*, *Lec.*
**Baris nitida*, *Lec.*
**Trichobaris insolita*, *Casey.*
†*Cylas formicarius*, *Fab.*
**Sphenophorus apicalis*, *Lec.*
**Cossonus*, n. s.
Tomicus cacographus, *Lec.*
*Scolytidæ, n. g. and n. s.

The species listed number 101; of these, eight are undescribed and four undetermined. Eight species mentioned in Mrs. Annie Trumbull Slosson's list, published in the January number of the CAN. ENT., are also enumerated, namely: *Staphylinus tomentosus*, *Languria marginipennis*, *Cryptomorpha desjardinsi*, *Photuris frontalis*, *Coptocycla bicolor*, *Blapstinus fortis*, *B. estriatus*, and *Cteniopus Murrayi*. Also *Pasi-machus subsulcatus*, *Harpalus nitidulus*, *Chrysobothris chrysoela*, and *Caryoborus arthriticus*, from her manuscript notes of captures at Lake Worth in December, 1894.

Staphylinidæ—*Pederus obliteratus*.—This beetle is abundant in April. The species occurring on the New Jersey sea-coast, usually determined *obliteratus*, is *P. floridanus*, which has likewise the elytral punctures more or less obliterated posteriorly, but very coarse anteriorly. *P. obliteratus* has a narrower head, longer elytra, with the punctures faintly indicated anteriorly and obsolete behind. It occurs as far north as St. Augustine, to my knowledge. *Bledius punctatissimus* occurred as formerly; one of the types of this species was from Southern California, and not that of *B. fumatus*, as a dislocation by the printer in the former paper makes it appear.

Languria marginipennis.—Abundant by sweeping weeds. April.

Cucujidæ—*Catogenus rufus*.—The larva of this widely-distributed species is eminently a wood borer, and in Southern Florida completes its transformations in about three months. Two mature beetles, in length .22 and .45 inch, respectively, were cut, April 25th, from sea grape (*Coccolobus*) killed by the December frost. The young larvæ started out about two inches apart, pursuing parallel routes for 23 inches before pupating. The beetles were over an inch from the surface, and no provisions had been made for their liberation. For the first ten inches of their course their burrows were eaten from the wood just-beneath the bark and packed with borings; the remainder of the burrows, also firmly packed, were in the solid wood. The larva of the small beetle had the same supply of food as that of the larger. Why the disparity in size? And why burrow the same distance?

Cryptomorpha desjardinsi.—Several examples of this graceful species were taken in April in the unfolding leaves of the Banana killed by the December frost, and in a state of semi-putrefaction. The larvæ and pupæ were seen in the cellular structure of the leaf beneath the epiderm. The Florida examples are identical in form, size and coloration with those from British Columbia.

Scarabæidæ—*Euphoria melancholica* occurred abundantly, March 1st, on thistles (*cirsium*)—*Trichius delta*, many examples occurred, May 1st, on the blossoms of the wild olive (*Olea americana*). It extends to the extreme south of Florida, having been taken at Key West.

Leptostylus, n. s.—This is a small species, .16 to .20 inch in length, of an ashy-gray colour, and but slightly depressed; the antennæ are conspicuously annulated; the thoracic tubercles are close to the base and in some examples acute, as in *Liopus*; the elytra are obliquely truncated

at tip, with small black dots arranged in irregular rows and with two blackish angulated lines behind the middle. It breeds in the stems of a slender cucurbitaceous vine (*Melothria pendula*) which grows over fences and bushes in dense festoons. Mr. Schwartz took this species at Bay Biscayne, and it may occur in the Bahamas and Cuba.

Leptostylus transversatus.—This species breeds in stumps and logs of the Mastich (*Sideroxylon pallidum*). The larva lives entirely in the bark, where it pupates in a cell, after the manner of a *Urographis*.

Spalacopsis linum, Duv.—This species was taken abundantly in April and in May on the dead vines of *Melothria pendula*, in the dead stems of which both larvæ and pupæ were abundant. The beetle is exceedingly slender, varying greatly in size, and in length from .20 to .60 inch. It occurs also in some of the Bahama Islands and likewise in Cuba, and is thus described by Chevrolat [Tr.]: "*Euthuorus filum*, Duv.—Filiform; head closely punctate, grayish-brown, with three obsolete pale lines; thorax linear, closely punctate, brownish-gray, with an obsolete pale line on each side and down the middle; elytra brown, variegated with maculations, especially near the suture; the apex margined, obliquely truncate and produced, longitudinally sulcate, closely and strongly punctate, interstices elevated; antennæ and feet brown. Length, 8-11 mill.; width, $1\frac{2}{3}$ -2 mill." (An. France, Series 4, Vol. II., p. 256.) Mr. Schwartz previously took this species at Bay Biscayne. Its occurrence north from Lake Worth has not been noted, but the vine in which it breeds extends around the Gulf to Texas. The pertinacity with which it feigns death is extreme, and till it moves it can scarcely be distinguished in the umbrella from the broken vines.

Hippopsis lemnistica.—Taken abundantly with the foregoing species, but it breeds in the stems of other plants or weeds besides *Melothria*. It extends westward around the Gulf and as far northward as Eastern Pennsylvania.

Caryoborus arthriticus.—This species, as is known, breeds abundantly in the seeds of the Cabbage Palm (*Sabot palmetto*). From about one quart of the berries placed in a covered paper box I obtained more than 100 examples. This species, however, breeds in the seeds of other trees, as I raised once several examples from the seeds of the Coffee tree (*Gymnocladus Canadensis*).

Platydemia subquadratum, Mots.—While the Florida and Arizona examples are considered as belonging to one species, yet they have a

distinct facies, and the under-side is differently coloured; those from Florida being luteous brown beneath, while the Arizona examples are bright rufous.

Hypophlaeus, n. s.—Three examples were beaten from *Melothria* vines, but whether they bred in them or in the cedar posts which supported them is not known, and the matter is mentioned to call the attention of future collectors. This species is narrower than *glaber*, which occurs also; the elytra are finely but distinctly punctured in close rows.

Talanus (Dignamptus) langurinus and *stenochinus*.—These two names represent the extremes of one species (Horn). Dr. Leconte having only one example of the latter and two or three of the former before him, and knowing nothing of the graduating intermediates, or the history of the species, found enough of differential points for two species. It was beaten abundantly from the dead vines of *Melothria*, in which it probably breeds, though I did not find larva nor pupa. It varies in length from .15 to .40 inch, which is no greater difference than is found in some other species, as *Spalacopris filum*, *Catogenus rufus*, etc. The colour of the types is represented as "black with a bluish gloss," and "black with a slight metallic gloss." All the examples taken by me, and others in my collection from Bay Biscayne and from Louisiana, are from light to dark castaneous. It requires a little faith to see any great resemblance to a *Languria*. Dr. Horn names the species as a whole *langurinus*.

Cryptorhynchus minutissimus, var.—This species was beaten in some abundance from both living and dead vines of *Melothria*, in which it probably breeds. The typical examples of this species in my collection from Louisiana, and also one taken at Lake Worth on another plant, have the thorax and elytra beautifully ornamented; but this variety is sordid brown, with the apical third of the elytra luteous. Some one hereafter may possibly describe it as a new species.

Trichobaris insolita, Casey. This species was taken abundantly in a patch of a species of ground cherry (*Physalis*), April 10th. None occurred afterwards nor elsewhere, though *Physalis* is abundant. It probably breeds in the stems of this plant, like *trinotata* does in the potato. I found a coleopterous larva in one of the plants, but no pupa, and so can not write with certainty.

Cylas formicarius.—Three examples were taken on the ocean beach from a rough, prostrate *compositous* plant, growing in mats on the sand. The species is said to depredate on the sweet potato, but in this

case there were no sweet potatoes or other convolvulaceous plants within half a mile. Many times I accompanied the gardener for sweet potatoes, but failed to find this species either above or under the ground.

Rhyncophorus cruentatus.—This species breeds in the dying trunks or stumps of the Cabbage palmetto; before pupating the larva forms an excavation, in which it constructs a cocoon in which to pupate; this cocoon is from an inch and a-half to two inches in length, its walls being over one-sixteenth of an inch in thickness, composed of fibre, cemented with some glutinous secretion.

Cossonus, n. s.—Under the bark of a dead limb of the Rubber tree (*Ficus aurea*) five examples were taken. The basal half of the elytra, metasternum and abdomen are rufous. Length, .12-.14 inch.

Scolytidae.—An undescribed species belonging to a new genus (*Schwartz*) occurs in the dead or diseased bark of the *Ficus* in incredible numbers. It breeds entirely in the bark, and it is not possible to trace its galleries. Length, .04-.05 inch.

* NOTES ON THE INSECT FAUNA OF SOMERSET CO., MAINE.

BY PHILIP LAURENT, PHILADELPHIA.

The following notes and observations were made during a two-weeks' stay in this county, ending on August 29th. The greater portion of our collecting was done in the neighbourhood of King & Bartlett Lake, and along the road leading out to Eustis. This section of Maine, if not the entire State, is anything but an "entomologist's paradise." The country is mountainous and covered for the most part with a dense growth of spruce, pine, birch, etc. Very little land in the entire county is under cultivation, so that those insects which we naturally look for in such places are almost entirely wanting. Many beautiful lakes are to be found in this part of Maine, but here again the entomologist is doomed to disappointment, as the water of the lakes is of an icy coldness, and very few aquatic insects are seen. The nights are invariably cold and but few insects are attracted to light. In a heavily-timbered country, such as we find in Somerset Co., Maine, it would naturally be supposed that the fallen trees would yield an abundance of insect life, particularly Coleoptera. A search of two hours, in which I overturned many dead trees and removed the bark from many others, resulted in the finding of exactly eight specimens of Coleoptera, and common species at that. Collecting with the umbrella and beating-net was a waste of time, as little or nothing rewarded our efforts. *Cicindela*

longilabris, Say, was found in abundance on the road to Eustis by Dr. Skinner, during his visit to this part of Maine in 1894; but this year only three or four specimens were observed. The only other *Cicindela* seen was *12-guttata*, Dej., which was quite common. A specimen of *Monohammus marmorator*, Kir., was the best capture in the line of Coleoptera. The following Coleoptera were also captured: *Tachys nanus*, Gyll.; *Pterostichus honestus*, Say; *Coccinella trifasciata*, Linn.; *Hyperaspis fimbriolata*, Melsh.; *Dicerca tenebrosa*, Kir.; *Ellychnia corrusca*, Linn.; *Aphodius fimetarius*, Linn.; *Trichius affinis*, Gory; *Rhagium lineatum*, Oliv.; *Monohammus confusor*, Kir.; *Monohommus scutellatus*, Say; *Doryphora 10-lineata*, Say; *Luperus meraca*, Say; and *Meloe angusticollis*, Say. In the capture of Lepidoptera we were somewhat more successful; not that this order was in any way better represented, but in the fact that some of our captures were new to our cabinets. There was not a lepidopterous insect observed of which we could say it was common. *Pieris rapæ*, Linn., outside of the small kitchen garden, was extremely scarce. *Grapta faunus*, Edw., possibly the commonest of all the Lepidoptera observed, was by no means very abundant, as only eighteen specimens were captured during our two-weeks' stay, and then only after a persistent effort on our part to secure them. *Grapta gracilis*, G. & R., a very desirable species, of which we secured nine specimens, was one of the few good things secured in the butterfly line. The small white aphid on which the larva of *Feniseca tarquinius*, Fab., is said to feed, was very plentiful on the branches of the black alder, but of *Feniseca* itself we only saw one or two specimens. On both occasions when I visited the alders it was after a heavy rain, and this may have had something to do with the scarcity of *Tarquinius*. Following is a list of Lepidoptera secured during our two weeks of collecting: *Argynnis atlantis*, Edw.; *Argynnis myrina*, Cram.; *Phyciodes tharos*, Dru.; *Grapta faunus*, Edw.; *Grapta gracilis*, G. & R.; *Grapta progne*, Cram.; *Grapta j-album*, Bd. & Lec.; *Limenitis arthemis*, Dru.; *Limenitis disippus*, Gdt.; *Chrysophanus hypophlæas*, Bdv.; *Pieris rapæ*, Linn.; *Colias philodice*, Gdt.; *Papilio turnus*, Linn.; *Arctia virgo*, Linn. ?; *Mamestra renigera*, Steph.; *Hadena arctica*, Bdv.; *Hadena modica*, Gn.; *Caradrina multifera*, Walk.; *Cirroedia pampina*, Gn.; *Scoliopteryx libatrix*, Linn.; *Pseudaglossa lubricalis*, Geyer; *Therina fervidaria*, Hbn.; *Cleora semiclusaria*, Walk.; *Triphosa dubitata*, Linn.; *Petrophora prunata*, Linn.; *Pinipestis Zimmermanni*, Grt.; and *Crambus vulgiva-*

gellus, Clem. Some little collecting was done in the other orders, and among the Hymenoptera the following have been kindly identified by Mr. Wm. J. Fox: *Urocerus flavicornis*, Fab.; *Urocerus albicornis*, Fab.; *Ichneumon grandis*, Brull.; *Paniseus glaucopterus*, Linn.; *Vespa maculata*, Linn.; *Vespa germanica*, Linn.; *Bombus bifarius*, Cress.; *Bombus vagans*, Sm. ?; *Pompilus tenebrosus*, Cress.; *Odynerus leucomelas*, Sauss.; and a species of *Halictus* not yet identified. Of the other orders the greater part of our captures are as yet unidentified. Dr. Wm. Hughes and Dr. Henry Skinner, my companions on this trip, rendered me much valuable assistance in securing specimens.

NOTES ON PSYCHODA.

BY NATHAN BANKS, SEA CLIFF, N. Y.

Mr. Alex. D. MacGillivray has sent me some Psychodidæ from Ithaca, N.Y., for names.

Psychoda Slossonæ, Will.

One male (June). The wings are clothed with blackish hair, and with two broad irregular white bands. The fringe on the posterior margin is blackish (in *superba* whitish); the abdomen clothed with white hairs (in *superba* with black); the legs are paler and with more white hair than in *superba*; and the white hair on head and thorax is not as long nor as dense as in *P. superba*. A female (Aug.) which is larger and more thickly clothed with white hair is, perhaps, the same as Williston mentions, and is, I think, the female of this species.

Psychoda albitarsis, n. sp.

Wing moderately broad, tip not very acute, clothed with blackish hair; some specimens show a patch of more dense hair on the middle near the costal margin; the fringe is black except at the tip, where it is white; behind the fringe is over four times as long as the width of a cell; head, thorax and abdomen densely clothed with black hair; legs with dense black hair, except the tarsi, which are white or pale yellowish. Antennæ very short, pale, with whitish hair. Length of wing, 2.4 mm.

Differs from *P. nigra* by white apical fringe, and white tarsi and less pointed wing; from *P. marginalis* by larger size, white tarsi and black haired body. Eight specimens, June and July, on *Rubus odorata* at Ithaca, N.Y.

Psychoda alternata, Say.

A few specimens of this species from Ithaca, N.Y., are smaller than those from Long Island.

Psychoda cinerea, Bks.

One specimen from Ithaca of this species is not quite as dark as the types.

NOTE ON THE LARVA OF HEMILEUCA CALIFORNICA, WRIGHT.

BY HARRISON G. DYAR, NEW YORK.

In CAN. ENT., 1894 (Vol. XXVI., p. 293), Prof. G. H. French described the early stages of this species, but failed to get the larvæ past their second moult. Prof. French kindly sent me eggs, and I have raised the larva through all its stages. It is, however, exactly like the normal *H. maia*, already described by Prof. Riley and Dr. Lintner, as we might expect from the position to which the moth has been assigned. I will, therefore, not take up space to redescribe the several stages in detail. The characters of the tubercles and setæ are such as I have described for the Hemileucidæ (Trans. N. Y. Acad. Sci., XIV., 55), and are the same as in *Pseudohazis*. In my account of the genus (*Psyche*, VII., 91), the statements about the arrangement of the setæ are inaccurate, owing to insufficient amplification (only a lens was used). I add, therefore, figures of the thoracic and abdominal setæ, stages I. and II. of *Hemileuca*, showing the true arrangement, and these may be considered to stand also for *Pseudohazis*.

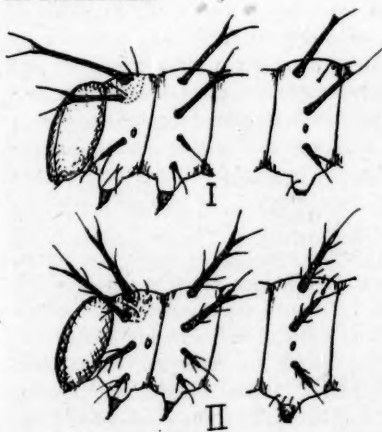


FIG. 23.

The peculiar shortening of wart i. takes place in stage III., and hence is not shown here.

It will be noticed that stage I. (Fig. 23) represents a primitive first stage, with tubercles iv. and v. consolidated and all the tubercles except three on the cervical shield and tubercle ii. on abdomen hypertrophied. In stage II. the tubercles are converted into elongate warts by the addition of setæ, but no sub-primary tubercles appear. A few secondary setæ may be distinguished, and these become abundant in later stages, parallel with the increase in number of spines on the elongated warts.

BOOK NOTICES.

AN ATTEMPT TO CORRELATE THE RESULTS ARRIVED AT IN RECENT PAPERS ON THE CLASSIFICATION OF LEPIDOPTERA. By James William Tutt, F. E. S.

This paper very instructively and readably puts together the conclusions attained by Comstock, Dyar, Chapman and Hampson on the subject, which is one which has lately received gratifying attention. It positively rains classifications! Hardly have I mailed off the *Systema* when Dr. Packard sends me a "New Classification," and it must be confessed that printers' ink has not been spared at the birth of the New Lepidopterology. Therefore this paper, in the *Trans. Ent. Soc.*, of London, Pt. III., for Sept., 1895, by Mr. Tutt, comes opportunely and affords useful reading. Mr. Tutt states at the outset, that this paper is not offered in a spirit of adverse criticism to any one of the particular lines indicated and worked out at length by these various authors. But, on the whole, the neuractionists come off a little the worse and for the apparent reason that their use of a single organ, with a limited field for the expression of its development, is open to the fatal objection that the same peculiarities are offered along different lines of descent. That this is actually the case appears from the result which Dyar, on occasion, obtains from the larval tubercles as compared with that obtained by Comstock from the wings. Undoubtedly the wings show evolution and indicate phylogenetic lines, but ultimate peculiarities of venation are not decisive of affinity in all cases. The time has perhaps gone by when a moth is excluded or admitted into a family on the sole ground that the costal vein merges with the subcostal, or springs free from base of the wing, or is separate a little way and then touches the subcostal at a certain point. "It is also evident," says Mr. Tutt, "that the results of the various systems, whether based on larval, pupal, or imaginal characters, must be compared, and the sum total of evidence brought together, if a satisfactory result is to be obtained." Towards the comprehension of the points of the various systems, Mr. Tutt's digest will certainly contribute.

Dr. Packard's New Classification seems, on reflection, exclusive of Prof. Comstock's. Upon the mouth parts of a smaller moth, referred not long ago to the genus *Micropteryx*, Dr. Packard founds a suborder, *Lepidoptera laciniata*, and refers *Micropteryx* and *Hepialus* into the other suborder, *Lepidoptera glossata*, which contains thus so nearly the whole of the order that it might be almost as well to refer the *Eriocephalidae* to the

Trichoptera and be done with it. The objection that Comstock's Frenatae includes many Lepidoptera without a frenulum is somewhat paralleled by the fact that some of Dr. Packard's Lepidoptera glossata (Fabricius's term for the order) have no tongue. The difficulty of "combining" these two systems lies in the fact that different organs are employed. Dr. Packard's paper closes with a genealogical tree at which my old friend, Mr. W. H. Edwards, if he is still standing on his rock and is not washed away by Dyarian waves, will no doubt lift his hands in astonishment. Dr. Packard has virtually abandoned the old Latreillean camp and joined the ranks of the new school.

In a far wider sense than as a correlator of contending systems, Mr. Tutt merits respect for his untiring industry and his success in raising the standard of scientific Lepidopterology in England; I might almost say in Europe, for the study itself has been in some danger of following the objects of the study, into the useful hands of the dealers in insects. With ever fresh enthusiasm and all the power of expressing himself clearly, Mr. Tutt combines both point and poetry, so that to read one of his discussions on synonymy is a pleasant task. The student, whether objectively of science, or subjectively of nature, cannot fail to be benefitted by Mr. Tutt's writings.

A. RADCLIFFE GROTE, A. M.

THE BUTTERFLIES OF NORTH AMERICA, with Coloured Drawings and Descriptions, by W. H. Edwards. Third Series, Part XVI. Houghton, Mifflin & Co., The Riverside Press, Cambridge, Mass.

Though nearly a twelve-month has gone by since the preceding Part was noticed in our pages, we could well afford to wait with patience for another issue, when our author rewards us with so much that is remarkably interesting, as well as valuable, regarding the life-histories of some hitherto little known Butterflies.

The first plate, which as usual is exquisitely drawn and coloured, depicts the female of *Parnassius Smintheus*, Doubl.-Hew., and both sexes of the variety *Hermodur*, Hy.-Edw., together with the egg, larva in all its stages, chrysalis, last segments of the male butterfly, and many highly magnified details. After giving a description of the various stages of the insect, the author relates many most interesting facts regarding the life and habits of the butterfly, which have taken expert observers in the

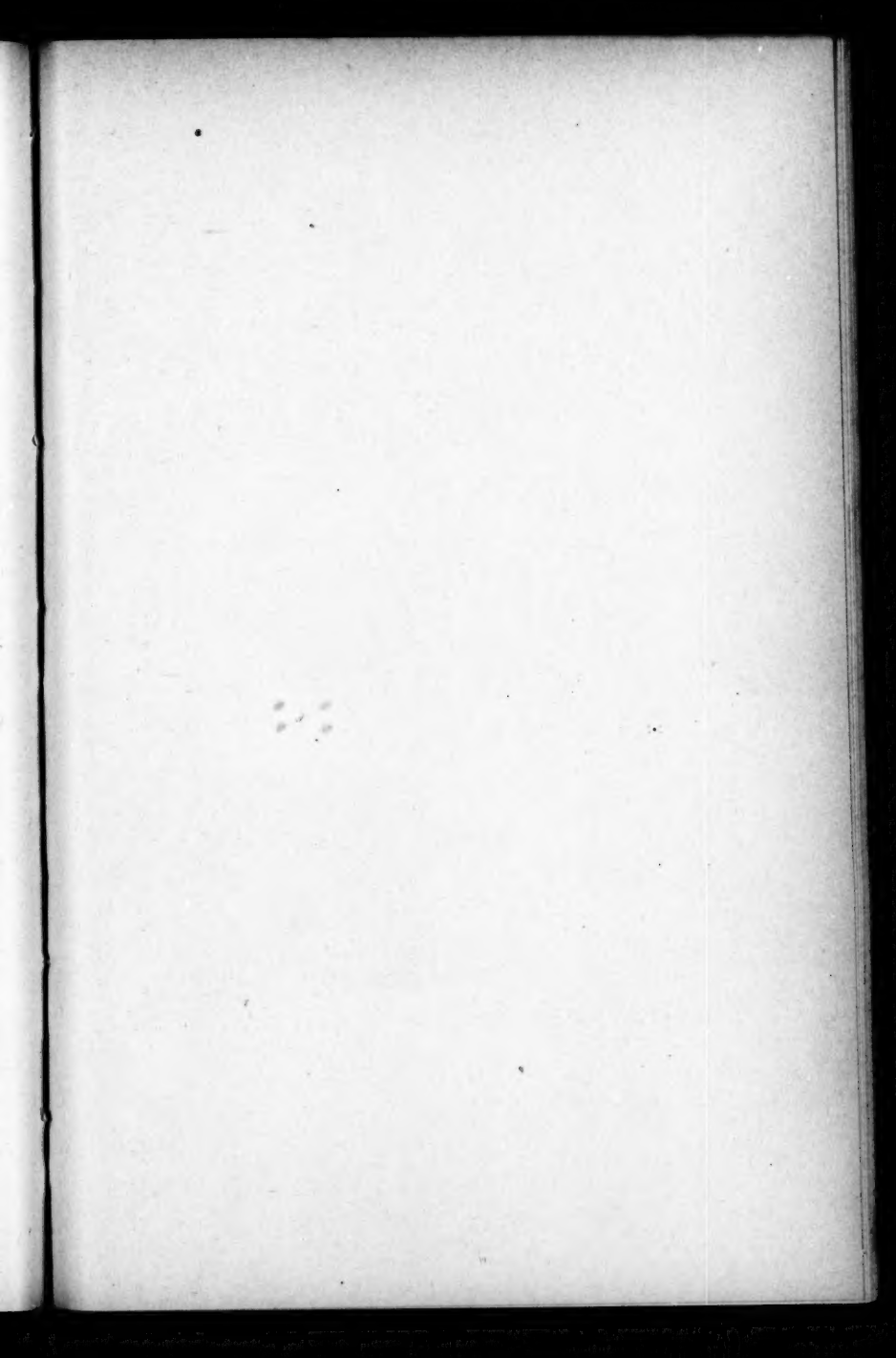
States of Colorado, Montana, and Washington, no less than twenty years to accumulate. The account is concluded with a description of the formation of the extraordinary pouch or keel which is to be seen beneath the abdomen of the females of various species of *Parnassius*. That this should be formed by the male is one of those strange marvels that render the careful study of the lives of our Butterflies so interesting and attractive.

The second plate depicts both sexes of *Satyrus Charon* and the male of its variety *Silvestris*; also the egg, the various stages of the larva, the chrysalis, and many details. The imago and the several preparatory stages are described, and a short but interesting account is given of the habits of the butterfly and the rearing of the larvæ.

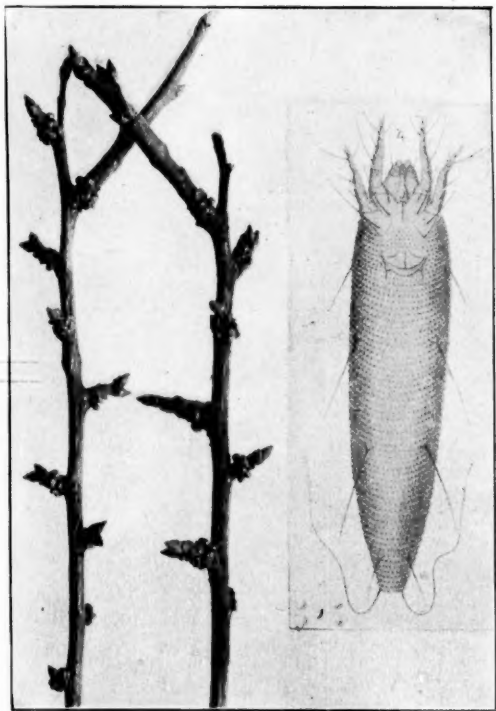
On the remaining plate are figured the egg, three stages of the larva with details, and both sexes of the imago of the British Columbia species *Chionobas Gigas*, Butler. After describing the preparatory stages so far as known, the author relates the differences in appearance and habitat between this species and *Californica* and *Iduna*, which are frequently confused in collections. *Gigas* is shown to be confined, so far as is yet known, to Vancouver Island, where the male frequents the tops of the highest mountains, the female being usually found much lower down. *Iduna* inhabits the slopes of the evergreen redwood forest in North-eastern California on the Pacific Coast; and *Californica*, the hot, arid regions of East Oregon, Washington, and the semi-desert portion of North-east California. "*Gigas* is semi-arctic, living amid the cold, dark fir forest; *Iduna* is temperate, living in the mild, dark redwood forest; *Californica* is semi-tropical, living in open, dry, warm glades in the 'bush-land,' on the border between the forest and the open plains. *Gigas* alights on bare rocks; *Iduna* on green twigs; *Californica* on dead or dry grass." But we must refer the reader to the book itself for all the interesting particulars regarding these strange Butterflies.

The wonder to us is that so few Entomologists subscribe to this magnificent work. The Parts are issued at such long intervals that the cost is very light; those who have secured them know what a treasure they possess and how highly they prize it.

Mailed November 4th, 1895.



CAN. ENT., XXVII., PLATE 6.



THE PLUM-TWIG GALL-MITE (*PHYTOPTUS PHLOEOCOPTES*, NAL.)

